

CYCLONEPLUS SERIES

CyclonePlus-9

High-Speed Machine Vision Camera



- METROLOGY AND HIGH SPEED MACHINE VISION
- LASER LINE PROFIOMETRY
- AUTOMATED OPTICAL INSPECTION (AOI)

- 509 fps with 4 096 x 2 304 pixels
- >66 000 fps with 4 096 x 16 pixels
- Global shutter with low noise pixel
- CoaXPress V2.0 interface with 4 x 12.5 Gbit/s
- Features: Flat Field Correction, Dual ROI, Line Skipping, Binning, Mirroring

DESCRIPTION

The CyclonePlus-9 is a high resolution camera with low noise pixels. It is part of Optronis CyclonePlus series for demanding machine vision applications. These cameras are streaming image data at up to 50 Gb/s to a CoaXPress frame grabber for real time processing.

- 4 096 x 2 304 pixel resolution with 509 fps
- Low noise pixel
- Short back focal (BF) distances
- Performant image processing features

PERFORMANCE (EXAMPLES, TYP., 8 BIT, 4xCXP12)

| Resolution (HxV) | Frame rate | Resolution (HxV) | Frame rate |
|------------------|-------------|------------------|-------------|
| 4 096 x 2 304 | 509 fps | 3 840 x 2 160 | 577 fps |
| 4 096 x 128 | 8 936 fps | 2 560 x 1 440 | 1 065 fps |
| 4 096 x 4 | 122 399 fps | 256 x 4 | 200 000 fps |

| EMVA1288 data (v3.1 typ.) | | 8 bit |
|--------------------------------|--|-----------------------|
| Dynamic range | | 57 dB |
| Saturation capacity | | 10 600 e ⁻ |
| Temporal dark noise | | 19 e ⁻ |
| System gain | | 46 e ⁻ /DN |
| Signal-to-Noise Ratio | | 40 dB |
| Absolute Sensitivity Threshold | | 15 e ⁻ |
| Dark Signal Non-Uniformity | | 64 e ⁻ |
| Photo Response Non-Uniformity | | 2.4 % |
| Non-Linearity Error | | 1 % |

FEATURES

| | |
|--|--|
| Exposure Mode | Timed |
| Trigger Activation | RisingEdge, FallingEdge, AnyEdge |
| Trigger Sources | External (Synch IN), CoaXPress, software |
| Trigger Filter and Trigger Hold-Off Time | Yes, for external trigger source |
| Trigger Delay | Adjustable |
| Flat Field Correction (FFC) | Block-based with up to 16 reference data in camera, auto calibration Column-based |
| Defect Pixel Correction | Yes, factory setting or customer configuration |
| Digital Binning Modes | Average, Sum |
| Digital Binning horizontal / vertical | x1, x2, x4 / x1, x2, x4 |
| Dual ROI | Yes |
| Line Skipping (Vertical Decimation) | Yes |
| Image Mirroring | Horizontal |
| User Global Adjustments | Offset analog and digital / Gain analog and digital |
| Programmable User Output | Yes |
| White Balance | Yes, with auto function ROI control, manual RGB gain |
| Counter and timer control | Yes |
| Image Stamp (Counter information in frame) | Yes |
| Save setup to flash and load on power-on | Yes |
| Over Temperature Monitoring | Yes |
| Firmware Update | via USB (CPH6-USB) and CXP |
| File Access Control | Yes, up to 3 MByte user data |
| Test Pattern Generation | Yes |

SPECIFICATIONS

| | |
|---|--|
| Sensor type | LUX9506, Global Shutter |
| Resolution | 4 096 pixel x 2 304 pixel |
| Frame rate (full resolution) | 20 .. 509 fps |
| Exposure time | 4 μs .. 1 / frame rate |
| Active area / Diagonal | 26.62 mm x 14.98 mm / 30.55 mm |
| Pixel distance | 6.5 μm x 6.5 μm |
| A/D conversion | 8 bit |
| Quantum efficiency (sensor) | 38 % @ 550 nm |
| Trigger | internal, external, CoaXPress |
| Trigger signals | Synch IN and Synch OUT, TTL level, electrically isolated |
| Interface | CoaXPress 2.0, Micro-BNC |
| Interface Configurations | 4 x CXP12, 2 x CXP12, 1 x CXP12, 4 x CXP6, 2 x CXP6 |
| Power | 18 W, PoCXP, ext. |
| Operating Camera Temperatures | |
| Operating Case | 0 .. +65°C / 32 .. 149°F |
| Operating Electronics | 0 .. +90°C / 32 .. 194°F |
| Operating Ambient Temperatures without additional cooling | 0 .. +15°C / 32 .. 59°F |
| with CYP-HIS | 0 .. 20°C / 32 .. 68°F |
| with CYP-FAN | 0 .. +40°C / 32 .. 104°F |
| Storage Temperature | -10 .. +40°C / 14 .. 104°F |
| Transport Temperature | -25 .. +65°C / -13 .. 149°F |
| Weight | 370 g w/o mount, w/o cooling |
| Dimensions | 65 mm x 65 mm x 65.5 mm (3D model data available) |

CyclonePlus-9 High-Speed Machine Vision Camera

Optronis

Make time visible

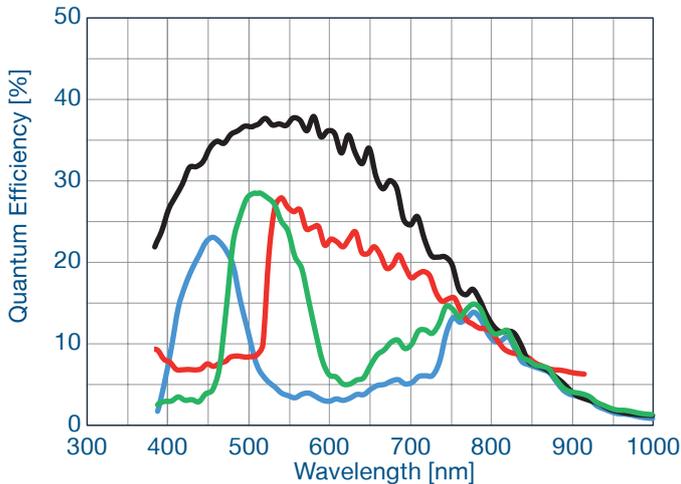
MODELS

| | |
|-------------------|----------------------------|
| CyclonePlus-9-M | monochrome Camera |
| CyclonePlus-9-C | color Camera |
| Scope of delivery | Camera, brief introduction |

ACCESSORIES

| | |
|---------------|-------------------------------------|
| CYP-CM | C-Mount lens adapter |
| CYP-FM | F-Mount lens adapter |
| CYP-M42-12 | M42 Mount lens adapter, BF 12 mm |
| CYP-M58-11,58 | M58 Mount lens adapter, BF 11.58 mm |
| CYP-HIS | Heat Sink |
| CYP-FAN | Cooling Fan |
| CPH6-PTC | Pig Tail Cable for synch |
| CPH6-USB | Programming Cable |

SPECTRAL SENSITIVITY



COOLING CONCEPT

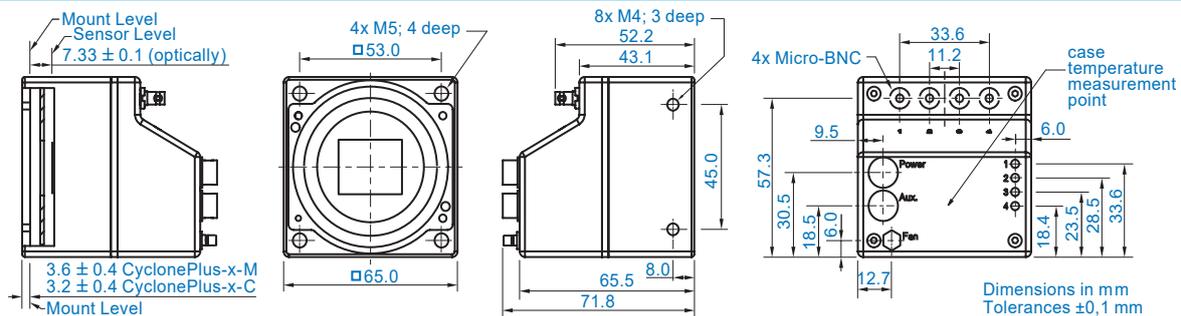
Passive heat sink or active fan can be installed by customer to adapt camera to operate at required temperatures. Alternatively, camera allows to be fixed onto a customer specific heat sink.

FLAT FIELD CORRECTION (FFC)

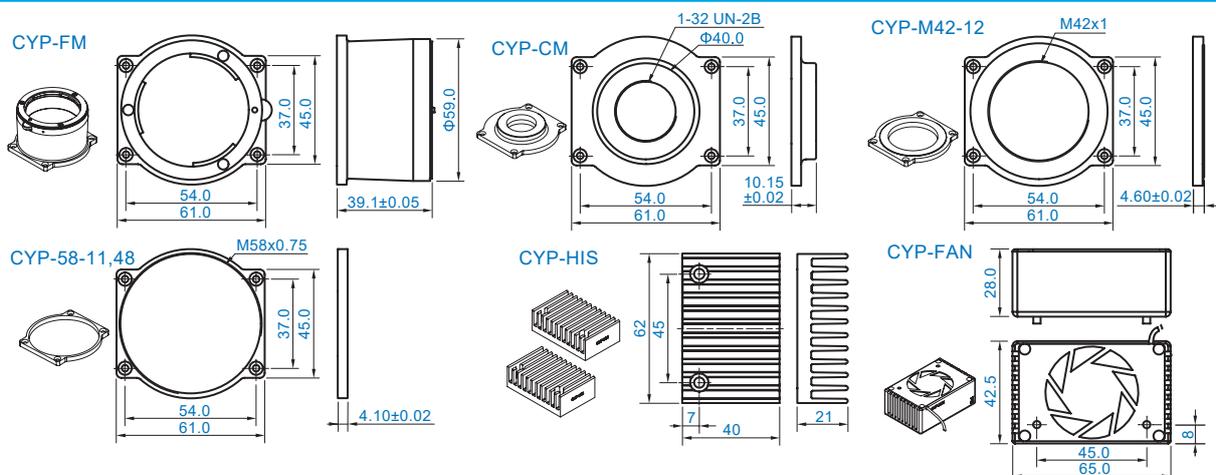
The camera allows FFC in real-time to correct non-homogeneous image intensity typically caused by non-homogeneous illumination or lens vignetting. Data of up to 16 reference images are saved in the camera.



TECHNICAL DRAWING CAMERA



TECHNICAL DRAWINGS ACCESSORIES



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